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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/646,509	08/22/2003	Brice A. Johnson	091-0185	9658

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EXAMINER	
AFTERGUT, JEFF H	

ART UNIT	PAPER NUMBER
1733	

DATE MAILED: 06/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/646,509	JOHNSON ET AL.	
	Examiner	Art Unit	
	Jeff H. Aftergut	1733	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-37 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-37 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date ---.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 2, 4, 6, 9, 10, 25, 26, 31 and 32 are rejected under 35 U.S.C. 102(b) as being anticipated by Koury.

Koury taught that it was known at the time the invention was made to provide for multiple fiber placement heads which were disposed on a ring. The reference taught that one skilled in the art would have applied fiber from the multiple fiber placement heads simultaneously. Each of the heads included a fiber supply as well as various controls which included control of the tension the fibers were placed under as well as relative position of the fiber heads relative to the mandrel surface so that the fibers are placed appropriately in the designated location on the tool disposed on the mandrel. The reference taught the use of a ring which carried the multiple heads as well as a cradle for the ring where the cradle for the ring was traversed along the axis of the mandrel while the mandrel was disposed for rotation about an axis of rotation. The reference taught all of the recited features of the claimed invention including the use a mechanical supporting structure 20A (Figure 7) wherein the tool (10A, 52) is moveable relative to the mechanical supporting structure 20A. the mechanical supporting structure 20A provides for movement of a plurality of material delivery heads (22, Figure 7) relative to the mandrel surface (10A, 52). At least one of the plurality of delivery heads

has an individual adjustable position relative to the mandrel surface, see claim 10 and controller 53, Figure 7.

The reference taught the use of a ring which is disposed in a ring cradle which supports the ring as depicted in the Figures therein (see Figures 7-11). The reference taught that the ring cradle moved along the axis of rotation of the mandrel 52. the reference clearly depicted a tailstock which was responsible for the rotation of the mandrel 52 as depicted. Regarding claim 6, the reference taught a plurality of fiber placement heads which each individually placed fibers on the surface (as opposed to tape laying devices). Regarding claim 9, each fiber placement device was provided with a fiber supply 26 which was disposed o the support ring as depicted in Figures 7-11. regarding claim 10, note that each of the plurality of placement heads was a fiber placement head. Regarding claim 25, note the discussions above regarding claim 1. Note that the device in Koury was used to manufacture an isogrid was used for wings and fuselage structures, column 1, lines 30-36. the reference taught the movement of the heads 22 along the axis of the mandrel. Regarding claims 31 and 32, see the discussion above regarding the machine of Koury.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-6, 9-15, 17-21, 23-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koury in view of the admitted prior art and either one of European Patent 198,744 or PCT WO 03/035380 optionally further taken with Ermert et al (the article entitled R U Reinforcing plastics with Robots?).

The applicant is referred to paragraph 2 above for a complete discussion of the reference to Koury. The reference to Koury clearly suggested that one skilled in the art would have incorporated multiple fiber placement devices in order to enhance the productivity of the fiber placement operation wherein one employed a ring with a plurality of placement heads disposed on the ring. The reference failed to expressly teach the use of the various known kinds of placement heads and additionally failed to teach that one skilled in the art would have independently manipulated each head relative to each other wherein the placement devices were associated with an arm for the movement of the placement devices. Applicant is more specifically referred to column 1, lines 39-55 and column 2, lines 41-53 of Koury. The reference to Koury additionally stated that the fibers applied could be bands of fibers, see column 6, line 60-column 7, line 6.

The admitted prior art suggested that it was known to apply fiber reinforcement with a tape laying head or a fiber placement head (which would have been able to apply the filaments along a contoured surface). These placement devices for fiber placement were known per se in the art of composite article manufacture. While the reference to Koury suggested that one skilled in the art would have utilized fiber placement devices, one skilled in the art would have been well aware that various devices were known in

the art for application of filamentary material including both tape placement was well as fiber placement devices. TO employ either device in the operation of Koury would have been within the purview of the ordinary artisan applying fibers to a form for application thereto. The reference to the admitted prior art as well as Koury failed to teach that the application device (whether it be fiber placement of tape laying) would have incorporated an arm as a manipulator for the application head. The references to either one of European Patent 198,744 or PCT WO 03/035380 suggested such an arrangement.

More specifically, each one of European Patent 198,744 or PCT WO 03/035380 suggested that it was known to associate an arm with a fiber placement of tape laying head in order to provide for the various degrees of freedom of movement of the head. The reference to E.P. '744 suggested that one skilled in the art would have utilized an arm with a placement head 5 including a roller for application of filamentary material from either a creel arrangement 8 or a tape from a spool supply 8a. clearly E.P. '744 envisioned that one skilled in the art would have understood that an applicator for a fiber placement device would have been disposed on the end of a manipulator which included an arm for multi axial movement. Note that the arm assembly provided for movement of the placement head in the exact local where one desired to disposed the fiber material. The reference to PCT '380 suggested as depicted in Figures 5, 6, 7, and 13 the use of multiple fiber placement devices wherein each device included an arm for placement of the applicator head about the tool or form being worked upon. Applicant is referred to the placement devices 20 and the discussion of the same in the reference. It

should be noted that each head is manipulated with an arm so that it is disposed at the proper angle for fiber placement. It would have been obvious to one of ordinary skill in the art at the time the invention was made to employ an arm as a means for placement of an applicator head of a fiber placement device as such arms were well known and useful for such manipulation as evidenced by either one of European Patent 198,744 or PCT WO 03/035380 wherein the placement devices would have included tape layers as well as fiber placement devices as such devices were well known for application of composite materials onto forms as expressed by applicant's admitted prior art wherein the device for application of the material included a plurality of applicators disposed about a form including a ring which was traversed about a rotating form as evidenced by Koury.

With regard to the various dependent claims, the use of a fiber placement device or a tape laying device for application of the composite material was well known as evidenced by the applicant's admitted prior art. The use of an arm to manipulate the applicator would have been within the purview of the ordinary artisan wherein such would have included the use of a controller wherein the arm provided for multiaxial movement of the placement device (such was known in the art at the time the invention was made and the reference to Koury clearly provided control for placement of the material by controlling the applicator devices). It additionally should be noted that the rate of application was directly a result of the number of applicators as well as the speed with which the applicators were capable of applying the material. As the reference to Koury clearly wanted to increase productivity with an increase in the number of

applicators, it would have been within the purview of the ordinary artisan to provide for the specified production rates by adding the required number of applicator heads and operating the device at a useful speed.

While the references to either one of European Patent 198,744 or PCT WO 03/035380 suggested that the use of an arm as a manipulator was well known for a fiber placement device, they do not afford one with the ability to interchange the heads to that the tool at the end of the arm could be altered to provide various applications (i.e. fiber placement of tape laying). However, the use of a robotic arm with an end effecter which was capable of being changed such that one could employ an arm with either a fiber placement device of a tape laying device as taught by Ermert. More specifically, the tool used at the end of the arm was capable of being changed in order to utilize the same robotic arm for various manipulative steps with differing tools. The reference suggested that the arm was capable of multiaxial movement. It would have been obvious to one of ordinary skill in the art at the time the invention was made to employ an arm with the fiber placement device in order to allow one to easily vary the tool disposed on the end of the arm as suggested by Ermert in the process and device of placement of fibers upon a form wherein an arm was used as the manipulator as taught by either one of European Patent 198,744 or PCT WO 03/035380 and wherein it was known to utilize various placement devices including fiber placement and tape laying devices as taught by the applicant's admitted prior art when plural applicators were disposed on an application ring which was moved relative to the rotating form as taught by Koury.

5. Claims 7, 8, 16, 21, 22, 36 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over the references as set forth above in paragraph 4 further taken with Baxter, Jr. et al and either one of Turner et al, Reinman, Gaubatz, or Trimble.

The references as set forth above in paragraph 4 suggested the overall operation, however they disclosed that the form was disposed in a horizontal position rather than a vertical position. The applicant is advised, however, that for large forms (mandrels) it was known to dispose the mandrel or form in a vertical position on and to raise and lower the fiber applicators as evidenced by Baxter. More specifically, Baxter provided plural applicators disposed on an application ring wherein the application ring was raised and lowered in a vertical direction while the vertically disposed mandrel or form was rotated. The reference provided that the use of a rotating vertical mandrel was an alternative to a rotating horizontal mandrel, see column 2, lines 65-70. It would have been within the purview of the ordinary artisan to rotate the mandrel in Baxter as the reference to Baxter itself suggested such an arrangement. The ordinary artisan is referred to any one of Turner et al, Reinman, Gaubatz, or Trimble for the specific manner of assembly of a mandrel in a vertical disposition wherein the mandrel is capable of rotation about its axis. It should be additionally noted that the reference to Baxter expressly states that the number of applicators allows for increased productivity in manufacture of large vessels. It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the techniques of Baxter, Jr. et al to mount the mandrel vertically with a plurality of applicators wherein one would have understood that the mandrel would have been capable of rotation when vertically

disposed as suggested by Baxter and provided by any one of Turner et al, Reinman, Gaubatz, or Trimble in the process and device for making a composite wound structure with a plurality of placement heads as taught by the references as set forth above in paragraph 4.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeff H. Aftergut whose telephone number is 571-272-1212. The examiner can normally be reached on Monday-Friday 7:15-345 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Blaine Copenheaver can be reached on 571-272-1156. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jeff H. Aftergut
Primary Examiner
Art Unit 1733

JHA

June 23, 2005